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HISTORICAL FUND
of the
NAVY MEDICAL DEPARTMENT

A committee has been formed with representation from the Medical Corps, Dental Corps, Medical Service Corps, Nurse Corps, and Hospital Corps for the purpose of creating a fund to be used for the collection and maintenance of items of historical interest to the Medical Department. Such items will include, but will not be limited to, portraits, memorials, etc., designed to perpetuate the memory of distinguished members of the Navy Medical Department. These memorials will be displayed in the Bureau of Medicine and Surgery and at the National Naval Medical Center. Medical Department officers, active and inactive, are invited to make small contributions to the fund. It is emphasized that all donations must be on a strictly voluntary basis. Funds received will be deposited in a Washington, D. C. bank to the credit of the Navy Medical Department Historical Fund, and will be expended only as approved by the Committee or its successor and for the objectives stated.

It is anticipated that an historical committee will be organized at each of our medical activities. If you desire to contribute please do so through your local historical committee or send your check direct, payable to Navy Medical Department Historical Fund, and mail to:

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Osgood-Schlatter Lesion

The only aspect of Osgood-Schlatter disease which is not controversial is its diagnosis. Generally, it is agreed that a persistently painful swollen tibial tubercle in an active adolescent is sufficient ground for the diagnosis. Opinions are about equally divided on the etiology of the disease; some favor a traumatic basis while others believe the disease is allied to the osteochondroses. Radiological descriptions have tended to be influenced by the osteochondritic theory. Little has been written about the pathology of the complaint as opportunities for histological examination have been few.

The etiology of Osgood-Schlatter disease is a matter of practical importance as well as academic interest. Although the subject of treatment is beyond the scope of this article, its dependence upon an understanding of etiology deserves mention. Without a knowledge of the fundamental cause, it is possible to determine only the efficiency of a particular line of treatment empirically; too conservative a method may be no more than palliative in effect while, conversely, a procedure which is curative may yet be unnecessarily radical.

The chief point at issue concerns the state of the affected area before the development of the presenting lesion. Many have favored the view that damage to the tubercle and its associated structures is preceded by underlying disease. Other writers believe that an uncomplicated and relatively acute injury is responsible for the condition.

The authors sought to clarify the etiology by a study of case histories and of radiological and histological appearances. Radiological examination offers valuable help in this problem in three ways. First, it gives an opportunity to observe the sequence of events in the tubercle during the progress of the disease. Second, it helps to exclude infective and neoplastic processes with their characteristic sequelae. Third, it makes possible a comparison with the tibial tubercle of the unaffected knee.

Histological examination, apart from confirming the existence of the lesion, can contribute to an understanding of etiology in two ways. First, the presence of old degenerative disease following which any traumatic effects might be a secondary event. Second, the presence of uncomplicated reparative changes in altered regions would afford evidence of normal reaction to acute damage. Observations presented in this review are positive in the latter respect, but negative in the former.

Positive evidence of altered architecture within the tibial tubercle complex can be adduced from most of the specimens studied, together with positive signs of reparative changes. On the negative side, failure to identify processes of a degenerative nature must be recorded.

The histological features, therefore, support the belief that trauma is a primary etiological factor and negate the hypothesis that the tubercle has been inherently weakened by preceding disease. The disruption of normal

appositional relationships between tendon, cartilage, and bone is a feature supporting the concept that the damaged complex has been subjected to excessive force. The fact that trauma was mentioned in only one of the case histories is not necessarily important because minor injuries during active adolescence often pass unnoticed; moreover, the history of the disability invariably extends over many months so that the traumatic incident may well have been forgotten by the time the history is taken.

The necessity of close correlation of the clinical examination with x-ray findings is stressed by several authors including Osgood. Caffey remarks that variability in the size, shape, and texture of tibial tubercles in different persons and in the same person on the two sides warrants considerable reservation before a diagnosis of fracture or Osgood-Schlatter disease is made. Most descriptions of the radiographic appearance are influenced by preconceived notions of etiology and attempts to reconcile the x-ray findings with those of the other osteochondroses, such as the Legg-Calvé-Perthes syndrome. The authors also believe, as does Steen, that insufficient emphasis has been placed on the dynamic aspect of the disease; if the limb is not immobilized, the tubercle is subjected to repeated minimal trauma and it seems that the radiological appearances may alter with the stage at which the patient is seen. Brailsford, an authority on osteochondritis, has freely admitted that he has not been able to find the same series of x-ray changes in Osgood-Schlatter disease as he has seen in osteochondritis in other sites. King also comments on the difficulty of distinguishing between the normal and Osgood-Schlatter disease and goes on to give one of the best radiographic descriptions of the complaint: "The tongue shaped process of the upper epiphysis of the tibia has irregular contours and shows intermingled translucent and opaque areas. The process may be displaced anteriorly, but the diagnosis must not be made on this observation alone. The bony portion of the epiphysis may consist of irregularly placed masses of osseous tissue, sometimes in the absence of a shadow of the tubercle itself or at times in addition to the irregular tongue. These masses may be larger, particularly in their antero-posterior diameter, than the tubercle of the opposite side.

"Translucent areas may occur in the form of bays on the surface, or irregularly rounded or oval spots in the epiphysis, or of fissures which run either antero-posteriorly or vertically. These last have given rise to the suggestion of fracture. In some cases, the translucent areas occur not only in the tongue shaped process, but also in the immediately underlying tibia, forming bays or fissures on its anterior aspect. As a result of these appearances being associated in various ways, the most diverse pictures are to be seen." Later, after describing the mottled and irregular appearances of the tuberosity, the same author goes on to say ". . . . . this is distinctive and 'in ideal circumstances' readily separates it from other conditions." The absence of any characteristic picture or sequence of events surely

indicates that there are no such things as "typical" radiographic appearance in the disorder.

Eleven cases of Osgood-Schlatter disease are presented, in seven of which histological examination of the tubercle was possible. There is no justification for regarding this condition as an aseptic necrosis of bone nor should it be grouped with the osteochondroses.

The distinctive features emerging from radiological and histological examination suggest that this condition is essentially the result of a dislocation of appositional structures within the tibial tubercle complex; that this dislocation is not preceded by underlying disease; that it is followed by repair reactions; and that its origin can most feasibly be ascribed to trauma.

The authors consider the term Osgood-Schlatter disease a misnomer. If the eponym is to be preserved, Osgood-Schlatter lesion would be a more accurate term and less misleading. (Cohen, B., London, Wilkinson, R. W., Reading, England, The Osgood-Schlatter Lesion - A Radiological and Histological Study: Am. J. Surg., 95: 731-742, May 1958)

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Malignant Effusions Treated with Radioactive Gold

Since its introduction by Sheppard and Hahn in 1947, radioactive colloidal gold has been administered clinically as a therapeutic agent in various ways: intravenous injection in patients with lymphoma and chronic leukemia; direct injection into the tumor site in patients with inoperable tumors; instillation directly into the bronchi in patients with bronchogenic carcinoma; and, most frequently, intracavitary administration in patients with malignant pleural and peritoneal effusions.

The radiation characteristics of Au^{198} make the use of this colloid appropriate for intracavitary therapy. Its 2.7 day half life provides a time period long enough for clinical purposes, yet short enough to avoid the possible damaging effects. Its decay products which consist of moderately energetic beta particles of 0.98 Mev and a soft gamma ray of 0.41 Mev allow for a uniform dose to the first few millimeters of the exposed serosal surface.

Müller first reported the use of radioactive colloidal gold in the treatment of 8 patients with ascites due to peritoneal carcinomatosis. The resultant inhibition of fluid formation in these patients encouraged other groups to undertake this form of treatment. Their reports which show favorable results in 30 to 40% of the patients irradiated confirmed the effectiveness of radioactive gold in slowing or stopping the formation of fluid in malignant effusions.

This article presents the results of 4 years' experience with the intracavitary administration of radioactive colloidal gold at the Memorial Center for Cancer and Allied Diseases, New York City.

Therapeutic dosages of Au^{198} were administered to 111 patients with malignant growths involving the pleural and peritoneal cavities. Treatment was administered to patients whose most important symptoms were due to fluid in the peritoneal and/or pleural cavities and who required frequent taps. All had effusions which were proved malignant by either cell block or biopsy at the time of exploration. Fifty-nine patients received intrapleural Au^{198} and 52 received intraperitoneal Au^{198}. Sixteen patients in each group were lost to follow-up. Four patients in each group survived less than one month after treatment. This was considered too short a time for adequate evaluation of results and these patients have been excluded from the study. Five patients treated prophylactically with the instillation of Au^{198} to prevent the growth of spilled malignant cells have also been excluded. The remaining 66 cases are presented in this review.

Patients with ascites received doses varying from 150 to 225 mc. in the first injection with an average of 175 mc. Patients who received pleural therapy were given a single dose ranging from 75 to 110 mc. with an average of 85 mc.

The radiogold was diluted with a volume of 200 to 250 c.c. of isotonic saline solution to insure a proper distribution of the radioactive material in the cavity and was injected after the method of Rose and associates. The size of the dose was adjusted to the individual patient with the initial dose never greater than 110 mc. for pleural therapy and 225 mc. for peritoneal therapy. The highest doses were administered in the abdominal reinjections given to 3 patients; (1) 375 mc. in three divided injections; (2) 530 mc. in four injections; (3) 675 mc. in five injections. These doses were administered over a period of 28 months and were well tolerated by all patients.

The palliative results in this study were analyzed in terms of the length of time required for the fluid to reaccumulate in the cavities. The authors used the time period most frequently used by previous investigators in order to facilitate comparison of results. "Good palliation" was achieved when no taps were required for a period of at least 2 months after treatment (included in this group are patients who received complementary taps 15 to 20 days after the gold instillation when the last tap was followed by 2 months of rest). "Fair palliation" was achieved when taps were required within a period of 1 to 2 months after treatment. "No palliation" was recorded when a tap was required less than 1 month after treatment and fluid reaccumulated in less than 2 months.

The survival period of the treated patients is reported in tables. The radioactive injection, however, seems to have no detectable effect on the survival time.

Sixty-six patients were observed in the present survey. Good palliation was achieved in 63.6% of the patients, moderate palliation was achieved in 21.2% and no palliation was achieved in 15.1%. Approximately 70% of the patients experienced relief from the subjective symptoms.

There is no correlation between survival time and administration of Au^{198}. (Seal, S.H., et al, The Treatment of Malignant Effusions with Radioactive Colloidal Gold (Au^{198}) - A Review of Sixty-Six Cases: Am. J. Obst. & Gynec., 75: 1027-1033, May 1958)

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Home Care in "Open-Negative" Syndrome

In recent years, a considerable amount of attention has been directed not only to the pathologic phenomena of so-called "open healing" of tuberculous cavities, but also to the patient who has acquired a noninfectious status despite persistent cavitation under drug therapy. It is well recognized that there is an increasing number of such patients who will not be surgical candidates. Also, there is a group of patients with cavitary disease and sputum negative for tubercle bacilli who are surgical candidates, but who will not accept proffered surgical therapy. This article presents the preliminary experience of the writers with such a group of patients who have been discharged to continue on drug therapy at home.

Between July 1, 1953 and December 31, 1956, 159 patients with cavitary disease, sputum negative for tubercle bacilli, and pulmonary lesions stable on roentgenography were discharged from Battey State Hospital, Rome, Ga., and continued on drug therapy. Ninety-five of these patients were Negro and 64 were white.

The white male group ranged in age from 28 to 72 years, the average age being slightly more than 52 years. The white female group averaged approximately 39 years with a divergence between 21 and 69 years. The Negro male group averaged slightly more than 45 years, the age extremes being 16 and 80 years. The Negro female group averaged 42 years of age with the extremes of 16 and 73 years.

The average period of hospitalization for each patient approximated 2 years and most patients received chemotherapy for the same period. In the white female group, there were 2 patients with long periods of hospitalization and shorter periods of drug therapy. One patient had been hospitalized for 75 months and had received chemotherapy for the last 49 months of hospitalization; the other patient had been hospitalized for 91 months and had received drug therapy for the last 39 months of hospitalization. The data for these 2 patients thus account for an approximate difference in this group of 6 months between the hospital stay average in months and chemotherapy in months.

The authors believe it is important to know something of the type of drug therapy given to a group of patients such as these while they were in the hospital. An analysis of their drug therapy shows that one patient received only isoniazid, 68 received isoniazid-PAS, 7 received streptomycin-PAS,

one received isoniazid-streptomycin, and 82 patients received streptomycin, isoniazid, and PAS. In other words, all but 7 of these patients received isoniazid-containing regimens for a considerable length of time.

As a group, the patients had attained a noninfectious status for a year to a year and one-half prior to discharge from the hospital. The Negro patients as a whole had had sputum negative for tubercle bacilli for an average period of 16.6 months, and the corresponding value for the whites was 15.5 months.

Bell and associates reported a relapse rate of 43% in a group of 118 patients with the "open-negative" syndrome after 6 to 8 months of treatment with antituberculous drugs. It is not believed that three consecutive monthly negative-sputum examinations qualify a patient as one who has acquired true reversal of infectiousness.

In the present group of 159 patients, the relapse rate has been 8.8% up to the present time. There were 11 patients (7%) with bacteriologic relapse. In addition, there were 3 more patients with reactivation by roentgenographic or clinical worsening without change in bacteriologic status. With respect to reactivation, there was a difference between the sexes, one reactivation occurring among 58 discharged females and 13 reactivations occurring among 101 discharged males. This group of patients had been in a noninfectious status for a mean average of nearly 16 months prior to the time they were discharged from the hospital and, in addition to that, have a period of follow-up ranging from 3 to 48 months. As previously stated, only 26 of these patients have follow-up observations of less than one year.

It should be particularly emphasized that 152 of the patients in the group had received isoniazid while in the hospital. There were only 3 patients in the group who had been advised to take streptomycin-PAS as post-sanatorium drug regimen, while 153 had isoniazid-PAS, and 3 had isoniazid-streptomycin.

The death rate of 3.8% in this group occurred in people who had not had bacteriologic or roentgenographic relapse. They were not treatment failures. It was not possible to determine whether the people who were listed as having died from heart disease had died from cor pulmonale or from some other heart disease, such as coronary arterial thrombosis.

The group of patients who had refused surgery is small. Three of these (8.33%) have had reactivations of their disease during the period of observations.

There are many unanswered questions. For instance, how long should a patient with the "open-negative" syndrome be continued on drug therapy? It is believed that this must be highly individualized, but a considerable number of these people should be continued on drug therapy indefinitely. On the other hand, among the group of 38 patients whose drug therapy has been stopped, there have been no reactivations to date.

Only one patient from this group has been considered a public health menace. If such people can be adequately cared for medically in a home

situation, they are much happier and it is cheaper to maintain them on drugs outside the hospital than it is to carry them as inpatients. A considerable number of these people, even with cavitary disease, if given the opportunity, with public health clearance as to noninfectiousness, can become self-supporting and again take their place in society. (Corpe, R. F., Blalock, F. A., The Fate of the Patient with Persistent Cavitation and Noninfectious Sputum ("Open-Negative") after Discharge from the Hospital: Am. Rev. Tuberc., 77: 764-774, May 1958)

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Hepatic Function in Patients Receiving Promazine

Promazine is a phenothiazine derivative which has been shown to be effective in the management of patients with mental and emotional disturbances. This effect is apparently similar to that of chlorpromazine which has been widely used in the treatment of many mental disorders. The numerous reports of the occurrence of jaundice in chlorpromazine-treated patients has led to the acceptance of a small but definite incidence of jaundice as a toxic effect of this drug. The mechanism of the production of the jaundice has not been elucidated, but clinical and histologic studies have been considered consistent with an intrahepatic cholestasis.

Promazine differs from chlorpromazine only in the absence of the chlorine atom from the carbon 2 position of the phenothiazine nucleus. Only one patient has been reported thus far to have developed jaundice during the administration of promazine. This patient had also received chlorpromazine prior to being given promazine. In the present study, a large number of patients receiving promazine were carefully observed for the development of jaundice.

In one-half of this group, the effect of the drug on the liver was studied by serial determinations of hepatic function. No evidence of jaundice or hepatic damage developed in patients receiving this drug.

In 82 patients studied by a battery of tests, the administration of promazine resulted in no impairment of liver function. Even in the 38 patients with initially abnormal function, there was no worsening, and in 33 of these, there was improvement as the primary disease improved during the administration of the drug. The high incidence of initial hepatic dysfunction was related to the fact that promazine was frequently used for the treatment of alcoholic patients with delirium tremens. Jaundice did not develop in any of the 201 patients who were treated with promazine. The drug was administered for periods up to 10-1/2 months and in daily doses as high as 1400 mg.

From this study of only 200 patients who did not develop jaundice while receiving promazine, no estimate of the incidence of jaundice in promazine-treated patients can be made. Apparently, it is lower than the 1 to 5% incidence reported for chlorpromazine. This impression is supported by the

rarity of reports of jaundice attributable to promazine administration, although the drug has been given to more than 4 million patients. Furthermore, the lack of development of hepatic dysfunction in patients receiving promazine, observed in the present study, contrasts with the 20% incidence of hepatic functional abnormality in 47 patients receiving chlorpromazine reported by Shay and Siplet. Dickes, Schenker, and Deutsch have also described a high incidence of hepatic dysfunction in 50 patients receiving chlorpromazine. Azima and Durost have also reported a 25% incidence of elevation of serum alkaline phosphatase in patients receiving chlorpromazine. These authors observed only a 4% incidence of development of this abnormality in patients receiving promazine.

Two additional patients who developed hepatic dysfunction while receiving promazine have been reported. Both had also received chlorpromazine. One of these reported by Waitzkin had had a recurrence of jaundice after the readministration of chlorpromazine. Two months later, he was given promazine for 6 days and developed nausea, vomiting, and urticaria with recurrence of Bromsulphalein retention, but without clinical jaundice or significant elevation of alkaline phosphatase. The other patient was reported to develop clinical jaundice 2 days after promazine administration. He had also received chlorpromazine for a 2-week period ending 18 days before the onset of jaundice. In this case, the author postulated that the patient had been "sensitized" by the chlorpromazine and had developed jaundice with promazine administration because of the similarity of the chemical structure of the two drugs.

Twelve patients have been reported who have received promazine after episodes of chlorpromazine jaundice without recurrence of jaundice or hepatic dysfunction. In the 3 patients studied by Shay and in 5 of the patients studied by Hollister, readministration of chlorpromazine again resulted in jaundice or hepatic dysfunction.

The mechanism by which chlorpromazine produces jaundice is not well understood at this time. The absence of jaundice with the administration of an almost identical drug (promazine) raises an interesting pharmacologic question. The only structural difference between the two drugs is the presence of the chlorine atom in chlorpromazine. While halogenation, and particularly chlorination, of some hydrocarbons confers hepatotoxic properties on the molecule, this does not appear to be the mechanism of chlorpromazine-induced jaundice or hepatic dysfunction. There is no definite evidence that patients with hepatic disease are made worse by chlorpromazine. The few reports of disappearance of jaundice with continued administration of chlorpromazine are inconsistent with hepatotoxicity as the basis of chlorpromazine jaundice. Hollister, Shay, and many others have suggested that chlorpromazine-jaundice is the result of drug allergy or "sensitization." Gutman in a recent editorial has discussed this problem and concluded that the intrahepatic cholestasis resulting from chlorpromazine and other drugs

is a manifestation of drug hypersensitivity, although the precise mechanism is obscure.

Jaundice did not develop in any of the 201 patients treated with promazine. Hepatic function was evaluated in 82 of these patients before and after promazine. Hepatic function remained normal in 44 and improved in 33 of the 38 previously abnormal. In no patients receiving promazine was there worsening of function. (Korn, R. J., Rock, W., Zimmerman, H. J., Studies of Hepatic Function in Patients Receiving Promazine: Am. J. Med. Sci., 235: 431-435, April 1958)

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Thumb and Finger Sucking

Much has been written on the various phases of finger and thumb sucking by pediatricians, psychiatrists, psychologists, dentists, and orthodontists. Even lay publications have devoted much space to this debatable subject. However, few statistical studies have been made of this habit in healthy infants and children.

The present study investigated finger and thumb sucking and specific factors that were thought to be pertinent to this habit. When the term, "thumb-sucking," is used, it means "finger or thumb sucking." Thumb-sucking as discussed in this article refers to placing the thumb or fingers deep into the mouth many times every day and night and exerting definite sucking pressure. A total of 2650 infants and children were selected in consecutive order from a general pediatric practice. All patients were Caucasian and came from the middle socioeconomic group of the population. None of these infants or children had any chronic or congenital diseases that could alter their feeding habits. They ranged in age from birth through 16 years.

The mother of each patient was questioned verbally by use of open-end questions regarding feeding habits, whether the baby sucked his thumb or not, the age of onset and termination of this habit, length of time of feedings, and other factors. Each mother was urged to keep a record of length of time of feedings. These items were checked during monthly visits of the infants in the first year of life, quarterly visits the second year, and semi-annual visits thereafter. All patients were followed from birth and the parents were questioned in the same way regarding this habit beginning with the infant's first visit. One of the authors followed many of these patients until they were 17 years of age. The parents were not told they were being included in a study of thumb-sucking. Parents who could not be specific in their answers or could not remember certain items were not included in this study. The authors did not ask the questions in a leading manner nor solicit answers. Every effort was made to be as objective as possible.

All infants were on a demand feeding schedule and averaged six feedings per day for the first 3 months of life. A few infants took 5 or 8 feedings per day during this period.

In the older children, special attention was given to the examination of the mouth, the incidence of malocclusion, and whether the patient was receiving orthodontic care.

According to the authors' knowledge, this is the largest series of patients reported that has been statistically analyzed. Of the 2650 infants and children, 45.6% sucked their thumbs. There was no sex difference which is contrary to Desell and Ilg's observation that more boys than girls suck their thumbs. Breast feeding was not a significant factor in the incidence of thumb-sucking.

Feeding time was probably significant in the incidence of thumb-sucking. The majority of individuals in the present study, 81.6% of the total group, took 30 minutes or less to feed. Of patients in the group of "fast" and "average" feeders, 41.7 to 45.8% sucked their thumbs. Bakwin believes that inadequate sucking time as a cause of thumb-sucking is of minor importance.

Of interest is that there was a significantly higher incidence of thumb-sucking in infants who fed 30 to 60 minutes. The authors' opinion is similar to Pearson's, namely, that stimulation of the lips and mouth which are richly supplied with sensory nerve endings gives a marked feeling of pleasure. Once this satisfying sensation is experienced, there is a desire to have it repeated. Therefore, the more a baby sucks, the more the oral structures are stimulated and the more gratification is obtained. On this basis, the infant would tend to suck his fingers or thumb because the pleasure he derives has been so implanted and developed. The baby who spends less time for nutritional sucking does not have this pleasure so strongly developed because there is less oral stimulation and he may not suck his thumb. Sears and Wise showed that the oral drive is strengthened by the longer retention of the sucking method of feeding. Therefore, a substitute sucking habit would increase with a decrease in nutritional sucking. The strength of the oral drive, and not frustration in weaning, would determine the incidence of thumb-sucking.

The smallest percentage of those who sucked their thumbs was in the group that took 60 minutes or longer to feed. No suitable explanation can be offered for this fact.

The average age at which the thumb-sucking habit stopped spontaneously was 3.8 years. This is longer than the 2-year limit that has been mentioned in the literature. However, dentists state that cessation of the habit at this age is compatible with normal tooth and dental arch formation. If malocclusion is caused by the thumb-sucking, the displaced teeth and arch will spontaneously correct themselves after the sucking has ceased, especially after development of permanent dentition.

Of the 211 patients who had malocclusion, 117 sucked their thumbs (9.7% of all thumb-suckers). Of 86 children who wore braces, only 33 sucked their thumbs. This is not significant. Johnson studied 989 cases of malocclusion and found 173 patients (17.5%) who sucked their thumbs. In 24.5% of the thumb-suckers, the habit persisted one year or less. Sixty percent had broken the habit by the end of the third year. The authors are in disagreement with those who maintain that forceful measures should be instituted to stop this habit because of possible dental malformations and psychological problems.

Dental devices to stop thumb-sucking were not used in enough cases to be truly evaluated. The authors found that the habit terminated spontaneously in the great majority of patients and at an early enough age so that routine use of such a bar was not the usual procedure. Indications for the use of a dental bar and the related problems are discussed by Graber.

There was no correlation between colic and thumb-sucking. Twenty-eight patients used a pacifier of whom 8 sucked their thumbs. This small number cannot be statistically evaluated. However, patients were seen who did not suck their thumbs while using a pacifier, but began the habit when the pacifier was discontinued.

No correlation was found between psychological problems and thumb-sucking. Most authorities are of the opinion that the great majority of thumb-sucking stops spontaneously around 2 or 3 years of age and that forceful cessation of the habit will create neurotic symptoms and personality problems which are more serious than the sucking habit. One definitely cannot predict psychological problems because a child has been or is actively engaged in thumb-sucking. Kaplan believes that thumb-sucking which persists after the usual time for disappearance is a symptom of emotional disturbance for which the treatment must be based upon the etiology. Persistence of the habit may be due to boredom, fatigue, or unhappiness.

The authors agree with others that the problem of thumb-sucking has been overemphasized and parents are unduly alarmed. Parents should be informed and reassured about the relative harmlessness of this habit. Occasionally, it may continue because it has been established as a habit even though most of the psychological implications have disappeared

The present findings differ from those of previous reports, that the majority of patients who sucked their thumbs stopped by 1 or 2 years of age. In this study, 80.8% of those who sucked their thumbs persisted at 2 years of age, while 3.9% of those who sucked their thumbs stopped at 1 year of age or earlier. These figures are close to Johnson's results. From the authors' findings, it would appear incorrect to tell anxious parents that their child will stop this sucking habit by 1 or 2 years of age. (Traisman, A. S., Traisman, H. S., Thumb and Finger-Sucking - A Study of 2650 Infants and Children: J. Pediat., 52: 566-571, May 1958)

Use of Conventional X-Ray Film in Nuclear Warfare

The sensitivity of all photographic film materials to nuclear radiation introduces some doubt as to their usefulness in areas of high nuclear radiation levels resulting from a nuclear explosion. Due to the complexity of all the circumstances involved, it is difficult to make exact predictions on the limitations and protective measures to be taken. However, available data based on practical experience in nuclear explosions can be utilized to attempt an analysis of prevailing factors and to estimate whether conventional medical radiography will retain its place in emergency areas.

Two basic cases must be distinguished: (1) An air burst of a nuclear bomb, and (2) A surface or sub-surface burst of a nuclear bomb. In both cases, the relative contributions and significance of the initial blast and of the time-delayed radioactive fallout to the total dosage exposing the x-ray film must be considered.

1. Air Burst

There are three main sources of significant nuclear radiation after an air burst of a nuclear bomb:

a. The initial burst emits high energy gamma radiation and neutrons.
b. The neutrons of the initial burst induce gamma radiation on the earth to a considerable extent within a one to two-mile radius from ground zero.
c. Radioactive particles are formed in the column and the fireball of the burst and yield the so-called "fallout."

The relative and actual importance of these radiation sources depends largely upon the location of the burst with regard to the surface, on the energy yield of the explosion, and the meteorological conditions. The following considerations are restricted to a one-megaton (equivalent TNT) explosion and to slant distances greater than one mile from ground zero. This latter restriction is justified because for closer distances the destruction by blast and fire—except for strong underground structures—would be virtually complete. The initial nuclear radiation would probably prove fatal to about 50% of human beings even if sheltered by 24 inches of concrete. Thus, the possibility and need of diagnostic radiography would be eliminated for these reasons.

From data published by the Atomic Energy Commission, it can be derived that the initial total dosage (gamma radiation and neutrons) from a one-megaton air burst at one mile slant distance will not significantly affect medical x-ray film if at the time of the explosions it is stored in such a way that it is protected by approximately 80 inches of concrete or

110 inches of earth in the direction of the blast. For a 20-megaton blast, the required protection is provided by approximately 30% thicker layers. In other words, storage in a basement corner on the floor will provide this protection except for an overhead burst. It might be worth mentioning that the attenuation of concrete and earth for neutrons is higher than for gamma radiation, and because at distances greater than one mile the contribution of neutrons to the total dosage declines rapidly, sufficient protection against gamma radiation includes also protection against neutrons. For instance, the film material could be divided into two lots and stored in diametrically opposite corners of the basement in order to account for the unknown direction of the expected blast.

A small concrete vault providing some overhead shielding against scattered gamma radiation would provide additional protection. Basement storage proves increasingly safe for bursts at greater distances.

2. Surface Burst

With a surface or sub-surface burst the local fallout will assume major significance. Additionally, destruction near ground zero will be complete within a wide area, thus eliminating all means for medical radiography, whether based on the use of photographic material or other recording systems, e.g., xerography.

In a surface burst, large amounts of debris, earth, and dust are taken up into the fireball where they are fused or vaporized and become intimately mixed with fission products. The larger and heavier particles will descend from the column within about an hour and will form a roughly circular pattern around ground zero. The smaller particles are carried upward and may spread out some distance before they begin to fall. The time taken to reach the earth and the horizontal distance traveled will depend on the height reached, the size, and the wind pattern. Very fine particles may remain suspended for long periods and may travel many thousands of miles. Most of the larger particles, however, will probably reach the earth as local fallout within a few hundred miles.

Protection against fallout radiation presents difficult problems because of its widespread and persistent character. The contaminated area can be expected to extend well beyond that in which casualties result from blast, thermal radiation, and the initial nuclear radiation. Protective measures can be classified into passive and active categories: Passive protection implies remaining in the contaminated area and seeking shelter. Even basements of frame houses can attenuate considerable fallout radiation provided that commuting from and into outside areas is avoided. Active protection entails evacuation and/or decontamination. Both procedures are inevitably hazardous because they involve exposure of operating personnel.

Seeking shelter in relatively closed structures may be regarded as the best initial protective step. If commuting to outside areas is kept to a minimum, the radiation level can be kept very low and properly stored x-ray film material will hardly be affected. Decay of the fallout radiation with time will rapidly improve the situation allowing also for improvised protective measures for all photo-sensitive materials. Continuous monitoring of the radiation level is essential. If film material, stored in the sheltered area at the time of the burst (e. g., in a normal hospital), should become contaminated or exposed to the initial blast, its replacement by new material from an outside source through a contaminated fallout area becomes a problem. It must be transported in vehicles which offer some degree of protection, e. g., by suitable shielding or distance. For instance, if the material is flown into the area by helicopter, both height above ground and reduced time of exposure can keep the radiation level below a damaging threshold even over heavily contaminated areas. Once in the shelter, the film material will be safe.

Conclusions

1. The sensitivity of medical x-ray film in its original container to nuclear radiation is approximately 1/1000 of its sensitivity which the film assumes when exposed in a cassette in contact with intensifying screens.

2. Near ground zero of a nuclear explosion, medical x-ray film and equipment are rendered useless. However, general destruction in this area is so complete that no means for medical radiography would be available regardless of what radiographic system would be used.

3. For distances greater than one mile from a nuclear airburst, storage in a basement would provide sufficient protection for medical x-ray film from the initial blast.

4. For surface blasts, protection against fallout radiation must be considered in addition to shielding against the initial blast. Basement storage of film material will be adequate in most cases. For transport of film through heavily contaminated areas, monitoring of the dosage to which human life is exposed will indicate the time limit up to which film might be usable.

5. As an additional precaution, particularly against scattered gamma-radiation from the initial blast, two small concrete or brick vaults to be placed in opposite basement corners are recommended for film storage.

6. Danger of reducing the diagnostic value of a radiograph due to contamination of the developer solution is considered insignificant.

7. Medical radiography using conventional x-ray film will be feasible in the neighborhood of a nuclear explosion without extreme measures for protecting the film. (Nitka, H. F., Ph D., Possibilities and Limitations in the Use of Conventional Medical X-Ray Film Under Conditions of Nuclear Warfare: Armed Forces Med. J., IX: 648-653, May 1958)

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Acute Glutethimide (Doriden) Poisoning

Glutethimide (Doriden) has had an unusually rapid and widespread introduction into clinical medicine as a hypnotic and sedative. The present study summarizes the authors' experience in six cases of severe acute glutethimide poisoning which were managed with varying combinations of supportive measures, bemegride (Megimide), and external hemodialysis. There was one fatality which the authors believe would have been preventable with their present knowledge.

These patients with severe poisoning by a new drug epitomize the almost overwhelming problems besetting the clinical investigator of human toxicology working in the drug decade. The task of obtaining sufficient factual information to manage the poisoned patient rationally is always difficult and often impossible. It is estimated that, in the past year, 35,000,000 prescriptions were written for tranquilizing drugs and a recent index lists 42 products in the seven major categories of chlorpromazine, meprobamate, piperazine, piperidyl, prochlorperazine, promazine, and rauwolfia. If hypnotics and sedatives are added to the list, the number of interrelationships becomes manifold. The present study illustrates certain generalizations and provides specific information.

Glutethimide has progressed through the classical life pattern of new drugs which is as follows: enthusiastic introduction, reports of toxicity and overdose, and antidote or management of toxicity. The drug was originally introduced as a "sedative and hypnotic free from undesirable barbiturate effects." It has received wide clinical use as a bedtime sedative, a hypnotic in elderly patients, and an anticonvulsant. Nausea and skin rash are reported as side effects.

The cyclic variation in the clinical level of anesthesia noted in these patients is confusing and worthy of comment. Such cycles are much more prominent than in comparable degrees of barbiturate poisoning and can lead to difficulties in evaluating the patient and the effect of treatment. A talking patient may become completely unresponsive in a matter of minutes. It is known that glutethimide is largely excreted in the bile, but it is not certain whether the intestinal resorbate represents inert metabolite or active drug. It is possible that intestinal anesthesia may slow initial absorption—a mechanism which has been previously noted in severe phenobarbital poisoning.

Bemegride, introduced by Shaw, Shulman and associates, has widely been used for sedative intoxications in Europe. There has been relatively little documentation of clinical poisonings by blood levels and little experience in this country. During the past year, the drug has been under evaluation for acute barbiturate intoxication.

Bemegride has a probable nonspecific prolonged analeptic effect in other drug poisonings. It stimulates the respiratory and circulatory center and restores reflexes and consciousness. The electroencephalogram improves.

However, the drug also produces exaggerated reflexes, muscle twitching, tremor, clonus, hyperventilation, and epileptic potentials in the electroencephalogram. Indeed, bemegride has been employed as an EEG activating agent to replace pentylenetetrazol.

The use of external hemodialysis for the removal of toxic substances from the blood has been the subject of several reports and is not reviewed in this article.

On the basis of experience, the authors formulate a currently acceptable therapeutic philosophy for acute glutethimide intoxication. Mild cases will have a normal blood pressure and deep tendon reflexes and can be aroused by painful stimuli. The blood level will probably be in the range of 0.5 to 1.0 mg/100 ml. Such patients can be treated with symptomatic therapy and patience. They will awaken after a period of prolonged sleep. Moderate cases may manifest hypotension, shallow or abdominal breathing, absent or variable deep reflexes, and some plantar withdrawal. Pain response and corneal reflex should be present. The blood level will probably range from 1 to 3 mg/100 ml. Treatment should include early lavage of the stomach, but the physician should desist immediately if apnea or respiratory irregularity occurs. The use of endotracheal suction and oxygen and pressor drugs for hypotension are valuable—care is necessary to avoid overhydration. Cerebral edema represents a major threat. One may titrate the patient with bemegride using 50 mg. increments every 10 to 15 minutes and maintenance doses as needed to keep a "safe" state of anesthesia. It is well to be suspicious if more than 1500 mg. of bemegride is required to lighten anesthesia. The bemegride should be stopped immediately if clonus or convulsions are produced. Severe cases will show hypotension, areflexia, deep coma, absent plantar withdrawal, and pain response. The blood level will probably be above 3.0 mg/100 ml. Such patients should be titrated with bemegride immediately after taking a sample for glutethimide blood level before bemegride is given. Other measures are instituted as one is able. In event of failure to elicit light reflex or plantar withdrawal, a bemegride requirement greater than 1500 mg. on titration, convulsions from bemegride, or later deterioration of clinical state, plans should be made for external hemodialysis on an emergency basis. (Schreiner, G. E., et al., Acute Glutethimide (Doriden) Poisoning - The Use of Bemegride (Megimide) and Hemodialysis: Arch. Int. Med., 101: 899-910, May 1958)

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The printing of this publication was approved by the Director of the Bureau of the Budget, 16 May 1955.

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Adenoids and Hearing Loss in Children

Opinions differ widely as to the indications for adenoidectomy in children. These differences range from the routine performance of adenoidectomies on almost all children having recurrent upper respiratory infections to the opposite extreme of never removing the adenoids unless there is complete obstruction of the nasopharynx.

This study discusses the role of hypertrophied adenoids in children with conductive deafness by obtaining reliable preoperative and postoperative audiograms. One hundred children, 3 to 14 years of age, seen consecutively, were studied. They had been referred because of signs and symptoms referable to the ears and their condition fulfilled the following criteria: presence of hypertrophied adenoid tissue; presence of stabilized measurable conductive deafness as evidenced by a hearing loss of at least 15 db. in two or more frequencies in the same ear; and failure of conservative therapy (including antibiotics, local treatments, and in some instances, irradiation with radium and x-ray) to resolve the patients' symptoms. Following adenoidectomy—which in many cases was a revision of a previous operation —the patients were examined at varying intervals. As a rule, audiograms were performed at each examination.

Despite the fact that many of the children had been treated by the referring physicians over long periods, conservative therapy was often continued, sometimes for as long as two years. These hundred adenoidectomies represent, as a group, operations performed on children who had not responded adequately to conservative therapy.

The number of preoperative audiograms per patient varied widely. Only the last of these for each patient was considered in this study. While every effort was made to obtain presumably stable thresholds, it is doubtless true that at various times the children had somewhat better or worse thresholds than were measured at the last visit before the operation. Such variation is inherent in a study of this nature. In any event, the last preoperative audiogram was not consistently the best or the worst of the preoperative tests and seems to offer an acceptable baseline against which to compare postoperative findings.

Because audiograms are not performed routinely on children, hearing loss is probably much more prevalent than is commonly believed. Children are usually spoken to in a raised voice and losses are seldom noted until they approach 30 db. These losses occur insidiously in many children and may be present for months or even years before they are distinguished from mere childhood inattention. Adenoidectomies are often performed because of mouth breathing or chronic ear infection without preoperative audiograms; it seems reasonable to speculate that routine audiograms might reveal a substantial number of hearing losses in such children. In uncomplicated cases, hearing loss may subside under either conservative or surgical

treatment without its existence ever having been noted by either parents or physicians.

Routine audiograms seem clearly indicated for all children with recurrent attacks of otitis media, chronic inattention, history of mouth breathing, and earache due to hypertrophied adenoids.

The present investigation of the relationship between adenoidectomy and hearing loss admittedly does not meet all the requirements of a rigidly controlled experiment. In particular, any conclusions must be tempered by the absence of a control group. It might be argued that the observed cures and improvements would have taken place spontaneously without surgical intervention. However, it seems most unlikely that the proportion would be as high as 56% cures and an additional 34% improvements within 1 month after the operation. Several children who had had marked and consistent hearing losses despite medical treatment for as long as 2 years, suddenly achieved normal hearing in as little as one week after adenoidectomy. It would seem to be stretching coincidence too far to attribute this to anything but the adenoidectomy.

It is noteworthy that, except for eight children who required antibiotics over several days for a concurrent infection, no postoperative medication was used in this series.

The 38 patients with previous tonsillectomies and adenoidectomies whose hearing loss and ear symptoms either persisted or recurred are of particular interest. At surgery, all were found to possess considerable adenoid tissue, particularly behind the Eustachian tubes. In six instances, the tip of one or both Eustachian tubes had been amputated during previous adenoidectomy. In 10 instances, there was an extensive amount of scar tissue which bound the Eustachian tube to the postpharyngeal wall and blocked the orifice. In many cases, only the lower portion of the adenoid mass appeared to have been removed in the previous surgery.

In operations performed in the present group of cases, as much of the visible adenoid tissue as possible was removed under direct view with particular attention to the areas surrounding both Eustachian tubes. The soft palate was retracted with special instruments so that the openings to the Eustachian tubes and the surrounding area could be clearly visualized. In revisions of previous adenoidectomies, care was taken to remove not only the lymphoid tissue behind the Eustachian tubes, but the scar tissue in this area as well. The lymphoid tissue was removed with an upturned punch in instances where it extended up to the posterior choanae. Extreme caution was exercised to avoid injuring the underlying tissue and the Eustachian tubes.

Adenoidectomies were performed on 100 children suffering from various degrees of conductive deafness. In every case, conservative therapy including antibiotics, local treatments, and in some instances, irradiation with radium and x-ray, had failed.

After operation, of 78 children tested within two weeks, 40% were cured of their hearing loss and an additional 42% were improved. At the time of the last audiogram taken on all 100 patients, 63 were cured and 33 were improved; 3 showed no change and only 1 could be considered worse.

Despite the absence of a control group, the proportion of cures and improvements seems considerably higher than could be explained on the basis of spontaneous resolution. It is concluded, therefore, that when conductive deafness in a child with adenoid tissue does not respond properly to conservative therapy, an adenoidectomy can often lead either to cure or to substantial improvement. (Sataloff, J., Menduke, H., Adenoids and Hearing Loss in Children: Am. J. Dis. Child., 95: 529-533, May 1958)

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Controlling Heat Casualties at Military Training Centers

Heat injury (heat cramps; heat exhaustion; heat stroke) can be prevented by reducing work loads in hot weather, by protecting the trainee from extreme environmental heat loads, and by increasing his tolerance to heat through gradual acclimatization. Hot weather clothing designed to promote body cooling and the replacement of body water and salt lost in the sweat are two other preventive measures of prime importance. Indoctrination of trainees and training officers is essential in implementing a preventive program.

Despite the knowledge of such preventive measures, heat injury continues to be a medical problem in the Navy and Marine Corps. From 1951 through 1955, there were 1570 cases of heat exhaustion, 103 cases of heat cramps, and 93 cases of heat stroke admitted to the sick list. [1] Moreover the incidence rate for heat exhaustion and heat stroke in recruits is several times higher than in nonrecruits.

This suggests that preventive measures can achieve the greatest benefit if applied to recruit training. Under pressure of operational requirements, however, training commands show reasonable reluctance in applying the first two principles of prevention named above, i.e., reduced work and reduced exposure to environmental heat, on the basis that such procedures would lead to costly interruptions in the summer training schedule.

In 1954 and 1955, field studies were conducted by the Bureau of Medicine and Surgery at Marine Corps Training Stations. These studies led to improved methods for evaluating heat stress (Wet Bulb-Globe Temperature Index of Yaglou), which resulted in recommendations for adding preventive measures to the regulations on training activities in unseasoned recruits. A comparison of the incidence of heat casualties in Marine Corps recruits

at Parris Island, S. C., before and after introducing these procedures, indicated that not only was the incidence rate significantly reduced, but it was accomplished with less interference to training.[2]

On the basis of the results of these and related studies, the Committee on Sanitary Engineering and Environment of the National Research Council proposed the following:

RECOMMENDATIONS FOR CONTROLLING HEAT CASUALTIES AT MILITARY TRAINING CENTERS

I. Acclimatization

1. Training programs for trainees who are climatically and/or physically deficient should be limited in intensity and time. A breaking-in period of from 2 to 3 weeks with progressive degrees of physical exertion and heat exposure will usually suffice for achieving acclimatization.
2. Although acclimatization increases tolerance for heat, it confers no immunity against heat illness. Overexertion can cause heat injury even in mild weather.
3. Special provision should be made for identifying and handling heat susceptible individuals. Such attention is especially required by those who are overweight or those in whom circulatory or sweating deficiencies have been demonstrated.

II. Control of Physical Activity

(See Appendix I of NavMed P-5052-5 for details on instrumentation.)

1. Training programs in warm weather should be planned provisionally on the basis of the wet bulb-globe temperature index (WBGT), which combines shade-air temperature, radiation, humidity, and wind into a single value, computed by the following formula:

   WBGT = 0.7 natural wet-bulb temperature
   / 0.2 black-globe temperature
   / 0.1 shade-air temperature

   (This formula applies to environments that are warm enough to cause sweating, and to hot weather clothing now issued to Armed Forces personnel. The component thermal factors should be measured at the actual sites of training operations.)
2. When the WBGT exceeds 80° F., discretion should be used in planning heavy sustained exercises for unseasoned trainees.
3. When the WBGT reaches 85° F., strenuous exercises, such as marching at standard cadence, should be suspended in unseasoned

trainees during their first 2 to 3 weeks at camp while permitting training on a reduced scale after their second or third week.

4. Outdoor classes in the sun should be avoided when the WBGT exceeds 85° F.
5. All physical training should be halted when the WBGT reaches 88° F. Hardened troops, after having been acclimatized each season, can carry on limited activity at WBGT's of 88° to 90° F. for periods not exceeding six hours a day.

III. Water and Salt Intakes

1. Fluid intake must be sufficient to replace loss by sweating. During field exercises in hot weather at least one quart of water should be provided per man per hour. Men should be encouraged to drink ample water in small frequent installments. Forced maintenance of water balance may lead to stomach distention, vomiting, or cardiac embarassment.
2. Salt replacement for acclimatized troops is normally provided in their regular meals unless food intake is curtailed. Supplementary salt intake for unacclimatized trainees, or for seasoned troops doing heavy work in the heat, is best provided by drinking a 0.1% salt solution (one teasponnful of table salt in a gallon of water) and by recommending liberal use of salt with meals.
3. If water is not available, salt in any form should not be taken alone because salt is not absorbed readily in concentrated form and may cause local irritation and nausea. The use of salt tablets is not generally recommended.

IV. Rest, Sleep, and Recreation

1. Schedules for all trainees should allow a 10-minute rest pause every working hour; a relaxation period of at least one hour after the noon and evening meals and night sleep of not less than seven hours.
2. Trainee quarters should be equipped with window and door screens and be provided with suitable means of ventilation, natural or mechanical. This should also apply to recreation facilities, messing and sleeping quarters.
3. Where barracks' temperatures remain above 80° F. WBGT in the late evening hours, consideration should be given to artificial cooling as a means of insuring restful sleep and for providing relief for heat rash victims.
4. At least one field dispensary, strategically located, should be artificially cooled and be provided with a cooled ambulance for

quick transportation of heat victims. As an alternative to artificial cooling, the ambulance may be equipped with ice.

V. Previous and Intercurrent Illness

1. Individual susceptibility to heat disease is greatly enhanced by illness, infections, or any febrile condition including reactions to immunizing inoculations. A previous history of heat stroke, vascular disease or skin trauma, such as heat rash, acute sunburn, or any condition affecting sweat secretion or evaporation, increases the risk of heat injury. Special consideration should be given to these cases.

VI. Clothing

1. Clothing and equipment should be worn in such a way as to provide maximum skin ventilation, without unnecessarily exposing the skin to bright sunlight.
2. In moist tropic heat when solar radiation is not an important factor, clothing should be reduced to a minimum because it interferes with body heat loss.

VII. Education

1. A training program should be developed to implement the foregoing recommendations and to integrate these recommendations into all the training programs of the Services. This should be a continuing program not restricted to the training of recruits.

The foregoing information is intended to supplement that contained in the following official publications on heat injury and its prevention:

1. BuMed Instruction 6200. 7, Heat Casualties, Prevention of, 15 June 1954.
2. Manual of Naval Preventive Medicine, Chapter 3, Ventilation and Thermal Stress Ashore and Afloat, August 1956.
3. NavMed-P-5250-5 (TBMED 175), The Etiology, Prevention, Diagnosis, and Treatment of the Adverse Effects of Heat, 7 August 1957.

(CDR D. Minard MC USN, Thermal Stress Branch, OccMedDispDiv, BuMed)

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1. Thermal Trauma: Statistics of Navy Medicine (NavMed P-5028), 13: 5-9, March 1957.
2. Prevention of Heat Casualties at a Marine Corps Recruit Depot: Medical News Letter, 30: 29-31, 19 July 1957; J. A. M. A., 165: 1813-1818, December 7, 1957.

A New Navy Nurse Corps Career Horizon

WHY: To gain knowledge and understanding of the scientific principles underlying radioisotope and mass casualty procedures as they relate to medical diagnosis, treatment, and nursing care of patients.
In Medicine: The field of radioisotopes is rapidly expanding and developing in the Navy and requires "Nursing Participation."
In the Fleet: Advancement in the Navy nuclear power program demands "Nursing Readiness."

WHAT: Nuclear Nursing Course
Length of course - Four (4) months

WHEN: Course convenes 2 September 1958 and concludes 19 December 1958

WHERE: Department of Nuclear Medicine
U.S. Naval Medical School
National Naval Medical Center
Bethesda, Md.

HOW: Applications with enclosures to be submitted no later than 1 July 1958 to Chief, Bureau of Medicine and Surgery, Code 32, Navy Department, Washington 25, D. C.

Enclosures:
1. Two (2) passport size photographs 2-1/2x2-1/2
2. Obligated service agreement of 24 months (USN and USNR)
3. In case of Reserves, extension of active duty must be submitted to BuPers via BuMed to cover two (2) year period of obligation from completion of course.
4. Physical Examination SF88 (Copy of last examination acceptable if within past 6 months)
5. C.B.C., platelet, and hematocrit

WHO: Regular and Reserve Nurse Corps officers

Qualifications:
1. A minimum of three (3) years active duty
2. Baccalaureate degree
3. Optimum background: Basic sciences and mathematics

(NursDiv, BuMed)

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Symposium in Management of Mass Casualties Resulting from ABC Warfare

A panel discussion of the Medical Aspects of ABC Warfare Defense and Management of large numbers of casualties will be presented 6 June 1958 at U. S. N. H., San Diego, Calif. The members of the panel are all Medical officers who have had special training in these subjects.

Introduction
Captain H. A. Weiss MC USN, Head Radioisotope Laboratory, Atomic Defense Officer

Estimation of Casualties Resulting from Disasters
Captain V. C. Stratton MC USN, Assistant Chief of Surgery

Management of Large Numbers of Casualties at this Hospital in an Emergency
Captain W. N. New MC USN, Chief of Dermatology, Commanding Officer, Mobile Emergency Force

Initial Treatment and First Aid
LCDR W. C. Adams, Jr. MC USN, Surgical Service

Effects of Radiation, Control, and Treatment of Effects
Captain J. W. Koett MC USN, Chief of Radiology, Alternate Special Weapons Defense Officer

Effects of Other Potent Special Weapons Agents
Captain F. G. Soule, Jr. MC USN, Assistant Chief of Medicine, and Passive Defense Area Coordinator

Questions and Answers

All Medical officers of the Armed Forces, active duty and Reserve, as well as interested civilian physicians of the San Diego Area are cordially invited to attend and participate. (U. S. N. H., San Diego, Calif.)

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Recent Research Reports
(Concluded from last issue)

Naval Medical Research Institute, NNMC, Bethesda, Md.

1. Adverse Effects of Crowding on Reproduction and Lactation of Mice and Two Generations of Their Progeny. NM 24 01 00. 04. 01, 12 December 1957.

Naval Medical Research Institute, NNMC, Bethesda, Md. (continued)

2. Membrane Excitation of the Hodgkin-Huxley Axon. Preliminary Corrections. Memorandum Report 57-8. Related to NM 000 018.03, 12 December 1957.
3. Cultivation of Dengue, Western Equine Encephalomyelitis, Japanese Encephalitis, and West Nile Viruses in Selected Mammalian Cell Cultures. NM 52 05 00.01.01, 23 December 1957.
4. Learning in a Multiple-Choice Situation under Various Drive States. NM 000 019.01.07, 31 December 1957.

Naval Dental Research Facility, Great Lakes, Ill.

1. Effects of Saliva on the pH and Lactate Concentration in Dental Plaques: I Caries-Rampant Individuals. NM 75 01 27, April 1958.

Naval Medical Field Research Laboratory, Camp Lejeune, N.C.

1. Effectiveness of Levarterenol in the Treatment of Irreversible Hemorrhagic Shock. NM 71 06 09.1.6, April 1958.

Naval Medical Research Laboratory, Submarine Base, New London, Conn.

1. Pilot studies of a Scotopic Sensitivity Test. Report No. 285. NM 23 01 20, 14 June 1957.
2. Calculation of Relative Energy on Metameric Matches. Memorandum Report No. 57-7. NM 22 01 20.01.02, 16 August 1957.
3. Peak Vs. Total Energy in Thresholds for very Short Tones. NM 22 00 00, Task 22 03 20. Report No. 1, Subtask 2, 19 August 1957.
4. New Digit Designs for Use under Reflected Red Light of Low Brightness. NM 22 02 20, Report No. 1, Subtask 2, 20 May 1957.
5. Area-Intensity Relationship at Threshold for Three Stimulus Durations in the Human Fovea. NM 22 01 20, Report No. 1, Subtask 1, 20 May 1957.
6. Stereo-Distance Identification. NM 22 02 20, Report No. 2, Subtask 2, 22 May 1957.

Naval School of Aviation Medicine, NAS, Pensacola, Fla.

1. Serum Glutamic Oxalacetic Transaminase Activity in Humans Subjected to Positive Radial Acceleratory Force. NM 11 01 11, Subtask 1, Report No. 12, 17 January 1958.

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From the Note Book

1. Rear Admiral B. W. Hogan MC USN, Surgeon General of the Navy, attended a meeting of the Board of Trustees, American Hospital Association held in Chicago, Ill., May 12-13, 1958. (TIO, BuMed.)

2. Captain N. L. Barr MC USN, Director, Project RAM (Research Astronautical Medicine) and Deputy Director of the Research Division, Bureau of Medicine and Surgery, appeared on the Dave Garroway "Today" television program on May 13, 1958. Dr. Barr presented a demonstration of the technique and equipment for the transmission of physiological data over radio and television circuits. (TIO, BuMed)

3. Dr. E. L. Alpen, Head of Biophysics Branch, U. S. Naval Radiological Defense Laboratory, San Francisco, Calif., has been awarded a National Science Foundation Senior Post Doctoral Fellowship at the Radiobiology Institute of United Oxford Hospitals, Oxford University, England. Beginning in September 1958, the fellowship will extend for one year. Dr. Alpen will work with Dr. Laslo Lajtha in the radiotherapy department of Churchill Hospital on the effects of radiation on blood cell life span. During his stay abroad he will also spend a month at the Centre National de Transfusion Sanguine, Paris, France. (TIO, BuMed)

4. Captain W. B. Johnson DC USN, Chief of Dental Service, U. S. Naval Hospital, Great Lakes, Ill., has been appointed a member of the Examining Committee for the American Board of Oral Surgery. Captain D. E. Cooksey DC USN of the Naval Dental School staff has been continued as a member of this Committee. (TIO, BuMed)

5. Captain Ashton Graybiel MC USN lectured at the Annual Meeting of the American College of Cardiology held in St. Louis, Mo., May 21-24, 1958. The lecture was entitled, "The Work Electrocardiogram as an Aid in Regulating the Activity of Patients with Coronary Heart Disease." (TIO, BuMed)

6. Captain W. M. Silliphant MC USN, Director of the Armed Forces Institute of Pathology, participated as both speaker and moderator of a symposium in Knoxville, Tenn., sponsored by the Knox County Unit of the American Cancer Society on 22 May 1958. Captain Silliphant moderated a five-man panel discussion on thyroid cancer and addressed the meeting on "Carcinoma in Situ-Cervix Uteri." (AFIP)

7. In "Challenge of the Vertical Frontier," the author examines certain aspects of Russia's current technological triumphs and discusses, in general terms, the physiological, social, and philosophical aspects of the Age of Space.

(United States Naval Institute Proceedings, April 1958; Captain C. C. Shaw MC USN)

8. An analysis of the findings in 100 consecutively hospitalized patients with the final diagnosis of histoplasmosis is presented. The series was analyzed from the standpoints of: symptomatology, physical findings, skin tests, serologic reactions, roentgenographic patterns, and the surgical procedures and findings of 66 resected cases. (Am. Rev. Tuberc., May 1958; F. J. Curry, J. A. Wier)

9. A case of proven hemophilia due to specific deficiency of the plasma factor, antihemophilic globulin is described in a Negro infant. This report emphasizes the fact that hemophilia can occur in the American Negro and probably with greater frequency than has been suspected from the literature. (Am. J. Med. Sci., April 1958; P. W. Boyles, M. D., J. Currie, A. B.)

10. Massive bleeding from esophageal varices comprises about one-third of the major upper gastrointestinal hemorrhages and results in three-fourths of the deaths from this source. A study of 158 cases of esophageal varices is presented. In 132 of the cases, Laennec's cirrhosis was the etiology of portal tension and esophageal varices. A detailed statistical analysis of the cases is given. (Surg. Gynec. & Obst., May 1958; L. G. Ludington, M. D.)

11. The roentgen findings in systemic lupus erythematosus are individually ill-defined and nonspecific, but collectively they form a constellation of 6 stars: (1) pleurisy; (2) pneumonitis: (3) carditis; (4) splenitis; (5) enteritis; (6) arthritis. These manifestations correlate well with the clinical and pathological findings. (Am. J. Med. Sci., May 1958; D. M. Gould, M. D., M. L. Daves, M. D.)

12. Twenty cases of congenital vesical neck obstructions subjected to vesicourethroplasty have been studied. These cases have been followed from 2 months to 5 years. All cases showed some improvement though complete cures were infrequent. (J. Urol., May 1958; B. W. Young, J. D. Niebel)

13. Combined therapy, consisting of the administration of mechlorethamine (nitrogen mustard) at the end of a course of hormone therapy, has been given to children in the treatment of lipoid nephrosis. The effectiveness of the treatment has been assessed by comparing the frequency of recurrence of the disease and responsiveness to hormone treatment before combined therapy with the course of the disease after combined therapy. (J. Dis. Child., May 1958; C. D. West, M. D.)

14. "The Management of Bronchial Asthma in Children" is discussed in J. Pediat., May 1958; L. Unger, M. D. et al)

BUMED INSTRUCTION 1416.1B 14 May 1958

From: Chief, Bureau of Medicine and Surgery
To: Ships and Stations Having Medical/Dental Personnel

Subj: Professional fitness for promotion of officers of the Medical Department on active duty

Ref: (a) BuPersInst 1416.4B, Subj: Professional fitness for promotion of Naval Reserve officers not on active duty
(b) BuMedInst 1416.4, Subj: General information and instructions for the examination of officers of the Medical Department for promotion pursuant to the Officer Personnel Act of 1947 or the Women's Armed Services Integration Act of 1948.

Encl: (1) Summary of Requirements for USN, USN (T), USNR, Medical Service Warrant, and Dental Service Warrant Officers on Active Duty
(2) Professional Requirement
(3) Instructions for Preparation and Submission of Papers

This instruction sets forth a plan for the determination of professional fitness for promotion of officers of the Medical Department by means of written examinations or completion of specified courses of instruction in lieu of examinations. It is designed to stimulate the professional growth of officers as well as to insure that officers promoted are well qualified to perform all duties of their new grade.

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Policy

The U.S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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DENTAL SECTION

New Correspondence Course for Dental Personnel

The new officer correspondence course, U. S. Naval Dental Clinic Administration (NavPers 10401), one of a series of courses prepared by the U. S. Naval Dental School under the supervision of the Dental Division, Bureau of Medicine and Surgery, will be available about July 31, 1958. This course, which will be available to members of the Dental Corps and Dental officers of the Naval Reserve, is designed to prepare Naval Dental officers for greater responsibility in providing dental care to personnel of the Navy and Marine Corps. The course also provides a fundamental background necessary to meet the requirements of command.

The textbook used in this course is U. S. Naval Dental Clinic Administration (NavPers 10789). The textual material adheres to the concepts of organization, administration, and professional practice as set forth in the new Chapter 6 of the Manual of the Medical Department. Included is a sample organization manual which is offered as a guide in the development of similar manuals for individual dental commands.

The course is divided into six assignments, each of which is concluded with approximately 75 to 100 objective type questions. For purposes of Naval Reserve retirement and/or promotion, this course is evaluated at 18 points.

Applications for enrollment should be forwarded on NavPers Form 992 (Rev. 2-56) with appropriate changes in the "To" line, via official channels to the Commanding Officer (Code 5), U. S. Naval Dental School, National Naval Medical Center, Bethesda, Md.

Note: Copies of the textbook will be distributed without request to all ships and stations having dental facilities for inclusion in Dental Department libraries.

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Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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RESERVE SECTION

Annual Congress of the American Optometric Association

Eligible inactive Naval Reserve Medical Department officers may earn retirement point credit for attendance at the Annual Congress of the American Optometric Association convening at the Shoreham Hotel, Washington, D. C. during 25 - 28 June 1958.

A section on Military Optometry will offer three sessions, each of which has been authorized as creditable for the earning of retirement point credit. Attendance at these sessions affords an excellent opportunity for inactive Reserve Medical Department officers to be brought up to date on the latest developments in the field of Military Optometry.

The program for the section on Military Optometry is as follows:

Thursday, June 26, 3:30 p. m. - 5:30 p. m.
Motorists Vision and the Military Service
Panel discussion of topic as related to respective branches of the services. Panel to be composed of representatives of the Army, the Navy and the Air Force.
Friday, June 27, 8:00 p. m. - 10:00 p. m.
Military Occupational Vision
Saturday, June 28, 8:00 a. m. - 10:30 a. m.
Military Breakfast and Symposium
Visual Problems in Supersonic and Space Travel
Career Patterns in the Medical Service Corps

To insure proper accreditation, inactive Naval Reservists must register daily with the authorized military representative present.

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Course in Water Pollution Control

A special two-week active duty for training course in Water Pollution Control will be conducted at the Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, beginning 16 June 1958.

This course is designed for sanitary engineers and others with a wide background in water quality management. Bacteriological, chemical, and

biological phases of sanitary engineering problems are emphasized. Panels selected from the class study and report upon a number of questions which are intimately related to future courses of action in water quality management.

Eligible inactive Naval Reserve Medical Department personnel whose background and training is in the fields of sanitary engineering and public health may make application for this training.

Applications from personnel residing in the Fourth, Fifth, and Ninth Naval Districts are particularly desired and active duty for training orders may be issued with or without pay as budgetary considerations may dictate. The Chief of Naval Personnel has waived the requirement that personnel eligible for this course must have attended the orientation and advance course previously conducted at the above center. Security clearance is not required.

Additional information concerning this training may be obtained on Page XIII-10 (Change No. 3) of enclosure (1) to BuPers Instruction 1571.4C.

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Revision of Naval Preventive Medicine Course (NavPers 10703)

As this correspondence course is presently undergoing extensive revision, the Chief of Naval Personnel has authorized that it be withdrawn with no new enrollments after 6 May 1958.

Those individuals currently enrolled in NavPers 10703 may continue and will receive appropriate point credit for completion. This course will ultimately be replaced by a new correspondence course of the same title, NavPers 10703-A, based upon the Manual of Naval Preventive Medicine, NavMed P-5010.

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Veterans Administration Booklet

If you've been puzzled over veterans' benefits, you will be interested in a new booklet prepared by the Veterans Administration, Federal Benefits Available to Veterans and Their Dependents.

The booklet explains the nature of all major U.S. veterans' benefits, the eligibility requirements for each benefit, and where to apply. Copies may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C. Price, 15 cents.

(The Naval Reservist, April 1958)

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Watch Your Mailing Date!

If you are keeping close tab on your accumulation of retirement points, remember that the end of fiscal year 1958 is not far off. Reserve officers receive credit for correspondence courses as follows:

1. Credit for courses evaluated at 12 points or less will be granted upon satisfactory completion of the entire course. Credit will apply as of the date the last assignment was mailed.
2. Credit for courses evaluated at more than 12 points will be granted on satisfactory completion of (a) each 12-point unit of the course, and (b) the final unit which may be less than 12 points. Credit applies as of the date the last assignment of each unit is mailed.

Keep this in mind when you mail your assignments and you may be certain to receive retirement point credit in the desired fiscal year.

(The Naval Reservist, April 1958)

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PREVENTIVE MEDICINE SECTION

Cockroach Control in Naval Hospitals

(The third and final installment of this article)

5. Chemical Control Procedures

a. Insecticide resistance in cockroaches

(1) Since 1951, strains of the German cockroach, Blatella germanica, (in some localities) have developed resistance to larger and larger doses of such highly lethal insecticides as chlordane and dieldrin. This phenomenon has become so widespread that it seriously interferes with, and frequently precludes, effective control with the heretofore recommended insecticides. In this connection, it is rather surprising to note that the German cockroach is the only cockroach species showing significant resistance to insecticides.

(2) Where Naval hospitals suspect resistance because of signs of failure to adequately control German cockroaches, it is strongly urged that live specimens be submitted for actual determination of the presence or absence of significant resistance before proceeding empirically to substitute or alternate insecticides. Tests to determine resistance may be performed locally by the simple procedures outlined in AFPCB TIM 3, Methods for Determining Resistance of Insects to Insecticides, 1 October 1957 (available upon request from Armed Forces Pest Control Board, Forest Glen Section, Walter Reed Army Medical Center, Washington, D. C.), or live cockroach collections (25 or more specimens) may be submitted to the area Preventive Medicine Unit or to the Disease Vector Control Center, Naval Air Station, Jacksonville, Fla., for testing. Tests for determining insecticide resistance should be made on cockroach populations from precise problem locations aboard the suspecting activity. It does not follow, because some cockroaches from a certain station are found to be resistant, that all local cockroaches are therefore resistant.

(3) Determination of the presence and precise degree of resistance establishes whether or not this factor is responsible for control failures and provides a rational basis for further chemical control efforts, thereby effecting a savings in materials and manpower necessary to do an effective job. When the possibility of resistance has been ruled out either by adequate tests or simply on the basis of continuing effective control with the normally recommended insecticides the basic procedures described in paragraph 5b below may be followed with success, provided fullest attention is given to all details. A cogent argument for relying on the standard recommended insecticides in these cases can be presented. These insecticides are highly toxic to cockroaches, longer-lasting residually, less expensive, more readily available (standard items), and are better understood toxicologically than newer substitute materials.

b. Control of nonresistant cockroaches

(1) General

(a) Indoors. For the indoor control of all cockroach species including nonresistant German cockroaches, the use of either 0.5% dieldrin (preferred) or 2.0% chlordane residual spray as a "spot" treatment is recommended. Either oil solutions or water-diluted emulsions can be used. Retreatment may be made at 30-day intervals if required to maintain adequate control. Necessity for retreatment should be based on periodic inspections. Application of either material should be as a coarse wet spray or as a "paint" applied just to the point of runoff. The over all treatment of interior surfaces of occupied spaces is not permitted with either dieldrin or chlordane, hence the use of the term "spot" treatment. Applications should be made only to the harborages and to the surfaces frequented by cockroaches. In this connection, it is recommended that 5.0% chlordane dust be used in spaces which are difficult to reach with sprays, such as the interiors of hollow walls and partitions,

the spaces behind built-in cabinets, closets, and cupboards, and the interiors of permanently enclosed serving-line steam tables, switch boxes, and appliances. Neither dieldrin nor chlordane should be applied to surfaces exposed to frequent human skin contact. This applies especially to spaces extensively utilized or occupied by small children. Neither insecticide shall be used under any circumstances in hospital pediatric wards, nurseries, obstetrical and operating suites, and similar locations.

Note. When heavy infestations of cockroaches have developed and more rapid cleanout is desired prior to establishment of control on a preventive maintenance basis, some additional benefit can often be realized by using a combination residual spray consisting of an oil solution of equal parts of either 0.5% dieldrin (preferred) or 2.0% chlordane and Standard Navy Insecticide (1.0% Lethane or 1.5% Thanite plus 1.0% DDT).

(b) Outdoors. Measures designed for the control of cockroaches around and under buildings are essential to an effective cockroach control program in latitudes where domestic cockroach species survive and multiply in these situations. Where such is the case, it is recommended that the indoor control program be extended to include the application of 5.0% chlordane dust (method of choice) as a residual deposit to the outdoor natural habitats, i.e., crawling, feeding, breeding, and hiding places. Control may also be obtained in these locations with liquid residual spray applications of either 0.5% dieldrin or 2.0% chlordane water-diluted emulsion spray. Extensive inspection is required if all infested outdoor areas are to be located and treated. Special attention should be given to outdoor sewer manholes and similar habitats. Outdoor control measures minimize the possibility of entry or movement into buildings of normally outdoor-living species.

(2) Control measures for specialized indoor areas

(a) For cockroach control in pediatric wards, day nurseries, playrooms, examining rooms, and similar areas where dieldrin and chlordane cannot be used safely because of extensive activity by children, a synergized pyrethrins dust (1.0%) should be used. If a dust cannot be used because of appearance or if the spaces can be vacated, a synergized pyrethrins solution used as a contact spray will give high immediate kill. Neither of these formulations will provide long lasting control and frequent reapplications may be necessary. However, if scrupulous sanitation is combined with the use of long lasting residuals in surrounding rooms not routinely used by children, effective control should result.

(b) Delivery rooms, obstetrical and surgical suites, newborn infant nurseries, operating rooms, recovery rooms, and the like are off-limits to all of the insecticides listed or described here, except pyrethrum formulations. Scrupulous sanitation and cleanliness should preclude the need for insecticides in these locations. Proper use of insecticides in surrounding areas will,

in most instances, prevent infestation. If for some reason, it becomes necessary to disinfest such spaces, a synergized pyrethrins type spray is the safest known material for this purpose and one which presents no lingering residual health hazard. Even with the use of this insecticide, it is necessary to vacate spaces during treatment and for a period of four hours subsequent to treatment because of the solvent vapors resulting. Further particulars on the use of this nonstandard material are available from the appropriate area Medical or District Public works Office Entomologist.

c. Control of insecticide-resistant cockroaches

(1) When by adequate tests it has been definitely established that resistant cockroaches are present, the operator must substitute materials and reemphasize vigorous sanitary control. Substitute insecticides now available do not have the residual effectiveness of dieldrin and chlordane, therefore, recommendation for the use of these materials must be predicated on the demonstrated presence of resistance.

(2) Sharply focused sanitation assumes an increasing role of importance when dealing with resistant cockroach populations because rigidly enforced sanitary control enhances the chemical control measures used.

(3) Where the presence of resistant cockroaches has been demonstrated, it is recommended that 0.5% Diazinon residual spray emulsion (preferred), or solution, as a "spot" treatment (cf. paragraph 5b (1) (a) be used. Retreatment should be accomplished only as needed to maintain effective control. Recent over all experience with Diazinon, including use in a Naval hospital, indicates that good control can be expected from this insecticide for 3 to 5 weeks.

(4) Diazinon is not to be used as an aerosol, mist, or space spray indoors in occupied spaces. It is to be handled and applied by certified pest control operators only. Diazinon may be used safely in all hospital spaces except those listed in paragraph 5b (2) (a) and (b). Normally, control procedures outlined for such spaces will also be effective against resistant cockroaches. Malathion (not listed) is not normally recommended for use indoors in Naval hospitals because of its objectionable odor. Although somewhat similar in physical and chemical properties to Diazinon, it is neither as effective nor as long lasting in cockroach control. However, a 3.0% malathion solution can be used if a sufficiently refined formulation can be obtained. Malathion is preferred to Diazinon as a residual spray for nonporous surfaces, such as metal or glass.

(5) For the control of resistant cockroaches outdoors and in hard-to-reach spaces as described in paragraph 5b (1) (a), the use of sodium fluoride dust is recommended. However, its use as a general purpose insecticide dust in exposed areas is strongly contraindicated.

d. Application equipment

(1) The insecticides recommended here are to be used only as "spot" residuals. Therefore, it is of the utmost importance that they be properly

applied with approved equipment for maximum results. A residual insecticide is no better than the technique and equipment with which it is applied. For most situations in hospital spaces, effective treatment can be accomplished with the standard stock two-gallon compression sprayer. The nozzle is the most critical element of any sprayer used for application of residual deposits. The proper nozzle for use in conjunction with this sprayer should produce a fan-shaped spray pattern of droplets large enough to wet the surface being treated. When properly used, very few undesirable smaller mist-sized droplets are produced to present an inhalation or skin contamination hazard to operator or occupants. As an added precaution, however, it is recommended that the operator wear a respirator (See paragraph 4b.) when applying residuals for a prolonged period in enclosed or poorly ventilated spaces. The nozzle is held approximately 18 inches from the surface to be sprayed and the spray applied in overlapping swaths just to the point of runoff. An attempt should be made to obtain a uniform and thorough coverage of all areas being treated.

(2) In confined spaces, the output rate of the Standard Stock two-gallon sprayer is too large for satisfactory use and excessive flooding often occurs because the wand cannot be manipulated fast enough. A compression one-quart blowtorch type sprayer with a coarse nozzle is desirable if extensive areas of confined spaces are to be treated. For guidance in selecting such equipment, it is recommended that the appropriate area Entomologist be consulted.

(3) The hand oilers listed are useful for forcing a fine jet stream into cracks, crevices, and holes.

(4) The Luer syringe and needle may be used for precision work in hard-to-reach locations and for forcing the liquid into very small crevices and nonelectrical insulation materials. Because a syringe requires frequent filling, it is perhaps more desirable to remove the tip of the nozzle from a one-pint forced-feed hand oiler and replace it with an 18 gauge Luer syringe needle which can then be secured with solder. When not in use, a cork can be kept on the needle tip for protective purposes. The paint brush and roller are often convenient for making applications to flat surfaces, pipes, screens, drawers, et cetera in limited touchup work.

(5) The dust applicators are used in the normal manner. It is often advantageous to remove the metal bulb, if so equipped, from the plunger-duster extension wand and to pinch the tip of the wand together to form a narrow slit opening. Dust can then be applied to cracks and crevices more precisely and with less contamination of surrounding surfaces. A nonstandard hand dust bulb is even more desirable for such work because it permits precise, neat application and is easier to use in confined spaces. For out of doors, where the dust is simply applied uniformly to affected areas and harborages, the hand rotary-duster listed is generally more suitable and time-saving.

(6) The importance of using adequate application equipment cannot be overemphasized.

e. Safety

(1) All insecticides are to be handled with caution because they are potentially hazardous to man. Although the principal danger is to the user, fundamental precautions must be considered in pest control operations. A full treatment of the proper usage of Navy standard pesticides is contained in Chapter 11 of the Manual of Naval Preventive Medicine.

(2) When extensive interior applications of dieldrin, chlordane, and Diazinon are being made, use an approved protective respirator, and if necessary, cap, gloves, and goggles. None of these insecticides are to be used as an aerosol, mist, or space spray.

(3) None of the insecticides listed here may be applied directly to food, water, cooking or eating utensils, or food preparation surfaces; precautions should be taken, especially in food-service areas, to protect such items by removal, securing in adequately covered containers, or covering with clean drop cloths. In addition, and as a routine procedure during interior application of residual sprays, operators should carry and freely use a "wipe cloth" for the removal of excess or spilled spray.

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Mammalian Bites of Children

A survey of 617 children receiving routine private pediatric care disclosed that 15.4% of those over 1 year of age had been bitten by a mammal, 2.1% of them more than once. The author reports a series of 157 cases of mammalian bites sustained by children over a 20-month period.

In this series, the preponderance of evidence showed that usually the child was at fault in provoking the bite. The dog was by far the most frequent offender; other animals involved were the cat, rabbit, squirrel, horse, rat, hamster, monkey, skunk, and raccoon.

Because the emotional and educational value of pets far outweighs the danger of bites and disease to which children are subjected from this source, seven rules of training and discipline are suggested to help prevent accidental biting of children by mammals.

1. Children should not own pets until they can care for them and show discretion in their handling. Such ability is rare under the age of 4 years and unusual under the age of 6 years.
2. Usually, older animals are to be preferred to immature ones as pets for young children.
3. Children should be taught that animals have rights, including an existence free of pain and excessive teasing.

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4. In the early years, children should be taught to avoid all strange animals, especially sick or injured ones. This precaution does not mean that a fear of dogs, cats, and other domestic animals should be created.

5. Even as toddlers, children should be taught not to trespass, and as older children, when riding bicycles they should deliberately avoid routes where dogs are known to chase vehicles.

6. Under the supervision of an adult, children should make friends with the pets in their immediate neighborhood.

7. Children should be instructed not to quell a fight between animals even though their own pet is involved. Instead, they should call for an adult, use a garden hose on the animals, or try to get their pet away from the melee by cajoling.

(Carithers, H.A., Mammalian Bites of Children: Am. J. Dis. Child., 95: 150-156, February 1958)

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